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regarded Mr. Darwin's career or the requirements of a work of art, no site could be so appropriate as this great hall; and they applied to the trustees of the British museum for permission to erect it in its present position. That permission was most cordially granted, and I am desirous to tender the best thanks of the committee to the trustees for their willingness to accede to our wishes. I also beg leave to offer the expression of our gratitude to your royal highness for kindly consenting to represent the trustees to-day.

"It only remains for me, your royal highness, my lords and gentlemen, trustees of the British museum, in the name of the Darwin memorial committee, to request you to accept this statue of Charles Darwin. We do not make this request for the mere sake of perpetuating a memory; for, so long as men occupy themselves with the pursuit of truth, the name of Darwin runs no more risk of oblivion than does that of Copernicus or that of Harvey.

"Nor, most assuredly, do we ask you to preserve the statue in its cynosural position in this entrance-hall of our National museum as evidence that Mr. Darwin's views have received your official sanction; for science does not recognize such sanctions, and commits suicide when it adopts a creed.

"No: we beg you to cherish this memorial as a symbol by which, as generation after generation of students of nature enter yonder door, they shall be reminded of the ideal according to which they must shape their lives, if they would turn to the best account the opportunities offered by the great institution under your charge."

ROUTES INTO THE INTERIOR OF WESTERN CHINA.¹

A GLANCE at the map shows in Yun-Nan and the adjacent part of Burmah the proximity of several large rivers, which separate farther south, and empty

¹ Condensed from *Science et nature*.

along the coast between the Yellow Sea and the Bay of Bengal. Evidently the solution of the problem of reaching western China is to be sought in the course of these rivers or on their banks. The first of these rivers to the east is the Yang-Tze-Kiang, which may be easily ascended for seven hundred kilometres. Junks can proceed above that as far as Sion-Choo, in Se-Chuen; but it is impossible to go higher, and consequently impossible to reach Yun-Nan. South of the Yang-Tze-Kiang is the Si-Kiang, or Canton River, navigable to the city Pe-se, nine hundred kilometres. Regular caravans then proceed by land to Yun-Nan, a route which is shorter than by the Yang-Tze-Kiang.

But Song-Ka, the river of Tonquin, offers a shorter route than this; and Lieut. Kergaradec says that steamers of light draught can reach Laos-Kai, on the Chinese frontier, while junks ascend to Mang-Hao, in the centre of the Yun-Nan territory.

We have nothing to hope from the Me-Kong. Its outlet is much farther away, and rapids are numerous. It is impossible at present to seriously think of building a railway on its banks a thousand kilometres in length, and, what is more, in an unknown, savage, and hostile country, and one of the most moun-

tainous regions of the world. The Saluen empties into the Indian Ocean; but in most of its course it flows near the Me-Kong and Yang-Tze-Kiang, and traverses with them the province of Yun-Nan. Starting from Martaban, a stone road could proceed to the junction of the Main-Long-Gye, follow this river, traverse the mountain range which separates the basins of the Saluen and the Me-Nam, proceed to Zimme, then to Kiang-Hai, descend the He-Kok to the Me-Kong, and ascend this river to the frontier of China, and even as far as Talifu. This is a long and very hilly course; for it is necessary to pass from one basin into a second, then into a third, and, further, to build the route into the valley of the Me-Kong, — a plan any thing but practicable. It means gigantic labor and incalculable expense, without considering the probable hostility of the population.



A railway already follows the lower course of the Irrawadi, between Rangoon and Prome. This route has just been extended to Tungu on the Sitang, and ultimately will proceed to Mandalay, and even to Bhamo. A branch could be made at Mandalay, and touch the Me-Kong at Kiang-Tung, though in this comparatively short space it must cross at least eight mountain chains having a height of two thousand metres. One can imagine the inclination of the sides and the depth of the valleys among mountains so near each other. The Saluen flows seven hundred metres below the hills which border it: it is therefore out of the question to consider this.

Another project is to start from Bhamo, and to reach Talifu by Man-Wyne or Momein. In this territory the hills are even more marked, more abrupt, and steeper, than in the preceding, and the population is much to be feared. Even the Brahmapootra has been suggested: it is easily ascended to Sooja, partly by rail, partly by steam; but above this the route is impracticable, there being a rapid and uninterrupted succession of high mountains and high-banked rivers.

To summarize these data, the two Chinese rivers must be abandoned, not precisely on account of the difficulties of the territory, but because for a long time the celestial empire will be more or less impenetrable and dangerous for Europeans, and the course of the Me-Kong is too long and too hilly. The routes which traverse the bed of the Brahmapootra and the valley of the Irrawadi present such obstacles that they are impracticable. The route of the Saluen is more attractive; but it must not be forgotten, that, besides its length, it must cross two watersheds, one of which at least is very difficult, and must ascend the Me-Kong for a very long distance. The route by the Red River remains, which is not at all wonderfully accessible; but, to establish communications with Yun-Nan and with Se-Chuen, some obstacles must be surmounted; and this is the course which offers fewest of them. Beside the fact that it is shortest, it will not be necessary to cross mountains or to traverse valleys. The French recently sent a commission of engineers to survey for a railway between Tonquin and Burmah. We doubt whether this project can be realized; but these investigations will necessarily bring forth important data in regard to the penetration of western China.

THE GEOLOGY OF JAPAN.

THE Japanese geological bureau has prepared a series of maps illustrative of the geology of the Japanese archipelago, to be presented at the Geological congress at Berlin this year. The bureau was established in 1879, and includes topographical, geological, and agronomical departments, and a chemical and technical laboratory officered by Germans. The area already surveyed by the topographers is about eighty geographical miles square; and the whole country is expected to be surveyed and mapped in about eight years more. The geological survey has reached about the same extent as the topographical. The maps and

accompanying text are being published in both Japanese and English. The agronomical survey was begun in 1882. A map showing the knowledge at present attained, of the geological structure of Japan, is amongst the series. The observations made are summarized as follows: All the geological formations are met with in Japan. Gneiss occurs in small quantities in the neighborhood of Nagasaki and in the centre of the main island. Crystalline schists, consisting of mica, talc, marble, serpentine, etc., are found in Shikoku and the south-west of the main island. The paleozoic formations embrace the largest portion of the country, and are found everywhere. The mesozoic formation, including trias, jura, and chalk, is also known in Japan, but is not so prevalent as the previous one. Trias occurs in the north and south-west of the main island and in Shikoku. Chalk is found widely distributed in Yezo, the main island, and Shikoku. The cenozoic formation, including the tertiary and quaternary, is found everywhere on the edges of the older mountain ranges. In these formations numerous remains of mammals are found, especially of prehistoric elephants. Of the Plutonic rocks, granite is found widely distributed, and covers, next to the paleozoic formations, the widest area. The volcanic rocks consist mostly of trachyte and andesite: basalt is rare. Among the soils in Japan is the so-called tuff, i.e., volcanic tuff, which, for the most part, consists of decomposed silicates, and which is of great importance to agriculture. It is almost wholly unknown in Europe, while in Japan it forms the greater part of the so-called *hara*, which are the uncultivated plains at the foot of mountains, but which will bear cultivation. Accurate knowledge of this kind of soil will be of the utmost moment to Japanese agriculture. It is also noticeable that Japanese soils in general are very poor in chalk, and would therefore be improved by the addition of marl and chalk.

AMERICAN ENGINEERS AT DEER PARK.

THE annual convention of the American society of civil engineers, just held at Deer Park, Md., June 24-26, will be remembered as one at which more business was transacted, and more discussion elicited, than at any previous convention of the society. In fact, the limit in this direction may fairly be said to have been reached; and the thin attendance at the meetings of the last day was followed early in the afternoon by a motion, which was unanimously carried, that the reading of the remaining papers be dispensed with, as the members were too tired to listen to them. The experience at the conventions of the past few years had indicated the advisability of devoting less time than formerly to excursions and sight-seeing; and the meeting this year was therefore purposely held in a place offering little of local engineering interest, and where almost the whole time could be devoted to the business of the occasion.

The convention was attended by over one hundred